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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 09/300,494 | 04/28/99 | CALDERBANK | A CALDERBANK-1 |

HENRY T. BRENDZEL
P.O. BOX 574
SPRINGFIELD NJ 07081

WM02/0410

EXAMINER

FAN, C

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 04/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/300,494

Applicant(s)

CALDERBANK ET AL.

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-8, 11-14 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3, 4, 7 and 8 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 3-8) in Paper No. 7 is acknowledged.

Specification

2. The disclosure is objected to because of the following informalities: "code is then" in line 15 of page 5 should be deleted.

Appropriate correction is required.

3. The statement the applicants made in lines 23-25 of page 14 (also in line 29 of page 14) appears to be inconsistent with the relationship $(R_1 > R_2 > \dots > R_L)$ in line 18 of page 14. For example, as indicated by the applicants, R_2 is the lowest rate in line 29 of page 14. However, on the other hand, according to the relationship $R_1 > R_2 > \dots > R_L$, R_2 would be the highest rate. The applicants are invited to review the validity of lines 17-29 of page 14.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 depends on a canceled claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claims 3, 4 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Calderbank et al. (US Patent 6,127,971).

Regarding claim 3, Calderbank et al. (different inventive entity) teach a transmitter comprising :

A demultiplexer (100 in fig. 1) responsive to an input signal for developing a plurality of at least two signal streams, and

A like plurality of channel coding/space-time coding transmitters (see 110, 110-1, 110-2, 120, 120-1, 102-2, 130, 130-1, and 130-2 in Fig. 1), each responsive to a different signal stream of said plurality of signal streams.

Regarding claim 4, Calderbank et al. teach that encoder 110 encodes the signal in according to a trellis code C1 and develops 2 symbols; encoder 120 encodes the signal in according to a trellis code C2 and develops 3 symbols; and encoder 130 encodes the signal in according to a trellis code C3 and develops 1 symbols (see col. 7, line 61-col. 8, line 3, and see col. 8, lines 20-24). Therefore, each of the encoders 110-130 implicitly includes a channel encoder and a space-time encoder. Further, Calderbank et al. teach each stream of data is input to a pulse shaper and a modulator before transmitted (see col. 3, lines 39-41). Therefore, each of the transmitters 110-1, 110-2, 120-1, 120-2, 130-1 and 130-2 implicitly includes a pulse shaper and a modulator.

Regarding claim 7, the channel encoder is a trellis encoder (see col. 8, lines 23-24).

8. Claims 3 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kotzin et al. (US Patent 6,173,005).

Regarding claim 3, Kotzin et al. teach a transmitter comprising :

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A demultiplexer (803 in fig. 8) responsive to an input signal for developing a plurality of at least two signal streams, and

A like plurality of channel coding/space-time coding transmitters (see 304, 806, 808 in Fig. 8, also see col. 14, line 3), each responsive to a different signal stream of said plurality of signal streams.

Regarding claim 8, encoder 304 may be a convolutional encoder (see col. 5, lines 30-35).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The following rejection is made by assuming that claim 8 is dependent on claim 3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. as applied to claims 3, 4 and 7 above.

Calderbank et al. do not teach that the channel encoder performs convolutional encoding. However, both trellis coding and convolutional coding are well-known

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channel encoding schemes in the art (official notice is taken here). The use of a trellis encoding or a convolutional encoding is merely a design choice.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kotzin et al. as applied to claims 3 and 8 above.

Kotzin et al. do not teach that the channel encoder performs trellis encoding. However, both trellis coding and convolutional coding are well-known channel encoding schemes in the art (official notice is taken here). The use of a trellis encoding or a convolutional encoding is merely a design choice.

Allowable Subject Matter

12. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Schilling (US Patent 6,128,330) teaches all the subject matters in claim 3, 4, 7 and 8 of the instant application, but the filing date is late.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6743 for regular communications and (703) 308-9051 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

Chieh M Fan 
Examiner
Art Unit 2634

cmf
April 7, 2001


STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600